



ACT
Government
Health

MICROBIOLOGICAL QUALITY OF
PRE-PREPARED SALADS
JANUARY-JUNE 2016

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EXECUTIVE SUMMARY

A pre-prepared salad is a salad that has been prepared prior to being made available for sale. This survey focused on pre-prepared salads that are available for purchase at cafes, food courts, clubs and restaurants. Pre-prepared salads if prepared incorrectly could pose a high risk if food preparation is compromised or if there is an unseen failure in food handling practices. There have been a number of foodborne outbreaks associated with pre-prepared salads.

One hundred and twelve samples were taken from twenty-two ACT retail outlets. All of the samples were tested for the hygiene indicator *E. coli* as well as food pathogens; coagulase positive *Staphylococcus*, *Bacillus cereus*, *Salmonella* spp and *L. monocytogenes*. Thirty-seven follow up samples were taken.

E. coli was found in 16 samples and *Bacillus cereus* in eighteen, with the majority of follow up resulting in either; inspection and education, or change in suppliers for the venues affected. This snap shot of twenty-two retailers suggests that the microbiological quality of pre-prepared salads in the ACT is generally good.



Above: Black quinoa broccolini salad by Jules. Published under the Creative Commons Attribution 2.0 Generic (CC BY 2.0) licence.

Cover picture: Tomato Salad by Ralph Dally. Published under the Creative Commons Attribution 2.0 Generic (CC BY 2.0) licence.

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BACKGROUND

A pre-prepared salad is a salad that has been prepared prior to being made available for sale. It is not a salad prepared immediately in response to an order from the customer. This survey did not focus on pre-packaged salads or salads from supermarkets. Pre-prepared salads are a popular method for restaurants, cafes and similar establishments to prepare salads for a large number of customers at once which may save staff time throughout the shift or food service.

If prepared unhygienically, these products can pose a high risk of food poisoning if food preparation is compromised or if there is a failure in food handling practices. Pre-prepared salads are categorised as Ready-to-Eat (RTE) foods. A RTE food is food that is consumed in the same state as it is sold or distributed and does not include food that is intended for hulling, peeling or washing by the consumers.

There have been a number of outbreaks associated with salads in Australia. OzFoodNet reported 24 outbreaks between January 2010 and December 2014 associated with salads, three of these occurred in the ACT²⁻¹⁸. The leading aetiological agent for these outbreaks was *Salmonella* spp with twelve outbreaks being attributed to this pathogen. *S. Typhimurium* was the most common serotype. Eight of these outbreaks were attributed to the use of raw eggs in the salad dressing. Of the remaining twelve outbreaks, seven were due to norovirus and one each to Scromboid fish poisoning and suspected bacterial toxin(s). For three outbreaks, the aetiological agent was unknown.

The survey was designed to target a wide range of outlets with a good geographical spread across the ACT. The aim was to encompass available sources of pre-prepared salads such as food courts, fast food outlets, restaurants, clubs, cafes and novel food retailers such as select green grocers. Previous ACT food surveys have targeted similar products such as pre-packaged leafy green salads, pre-packaged chilled products and self-serve salad bars, as such, these types of samples were not the focus of this survey.

This was the first time a survey of this product had been implemented.

OBJECTIVE

The main objectives of the pre-prepared salads survey were:

- > To assess the microbiological quality of RTE pre-prepared salads based on the Australia and New Zealand Food Standard (FSANZ) Guidelines for the Microbiological Examination of Ready-to-Eat Foods (FSANZ RTE Guidelines)
- > To determine, if possible, a link between contamination and the type of salad ingredient.
- > To identify any link between sample source and microbiological quality by comparing the results of the pre-prepared salads samples collected from different types of outlets in ACT such as supermarkets, food courts and farmers markets.

STANDARDS

The Food Standards Australia New Zealand (FSANZ) Ready to Eat (RTE) Guidelines identify four categories of microbiological quality ranging from satisfactory to potentially hazardous. Table 1 is an extract of FSANZ RTE guidelines and details the recommended guideline values. Table 1 not only reflects both the high level of microbiological quality that is achievable for RTE foods in Australia and New Zealand but also indicates the level of contamination that is considered to be a significant risk to public health.

Table 1 Categories of microbiological quality from the RTE guidelines produced by FSANZ

Test	Satisfactory microbiological quality (CFU per gram)	Marginal microbiological quality (CFU per gram)	Unsatisfactory microbiological quality (CFU per gram)	Potentially hazardous microbiological quality (CFU per gram)
Indicator: <i>Escherichia coli</i> (<i>E. coli</i>)	< 3	3-100	> 100	*
Pathogen: Coagulase positive <i>Staphylococci</i> (<i>Staph</i>)	<10 ²	10 ² -10 ³	10 ³ -10 ⁴	≥10 ⁴ SET +ve
Pathogen: <i>Bacillus cereus</i> (<i>B. cereus</i>)	<10 ²	10 ² -10 ³	10 ³ -10 ⁴	≥10 ⁴
Pathogen: <i>Salmonella</i> spp.	Not detected in 25g			detected
Pathogen: <i>Listeria monocytogenes</i> (<i>L. monocytogenes</i>)	Not detected in 25g	Detected but < 10 ² #		≥10 ² ##

NOTE:

* Pathogenic strains of *E. coli* should be absent.

Foods with a long shelf life stored under refrigeration should have no *L. monocytogenes* detected in 25g.

The detection of *L. monocytogenes* in ready-to-eat-foods prepared specifically for “at risk” population groups (the elderly, immuno-compromised and infants) should also be considered as potentially hazardous.

SURVEY

This survey was conducted between January and June 2016. During this period 112 samples from twenty-two ACT retail outlets were collected randomly by Health Protection Service (HPS) Public Health Officers (PHO) and processed by the ACT Government Analytical Laboratory. The survey collected multiple samples from single outlets with outlets only being sampled once, unless resamples were required.

All 112 samples were tested for the hygiene indicator *E. coli* and food pathogens – *L. monocytogenes*, coagulase positive *Staphylococci*, *Bacillus cereus* and *Salmonella*.

When the HPS identifies non-compliance issues in food businesses, corrective actions are addressed through a graduated and proportionate response. Marginal results may be re-sampled; this is dependent on resources as these foods are still considered compliant. Unsatisfactory results are re-sampled. Due to the nature of pre-prepared salads, resamples may consist of whole salads or individual salad components obtained from the premises.

MICROBIOLOGICAL METHOD OF ANALYSIS

Samples were tested for the presence of:

- > *E. coli*: method modified from ISO 16649.2 2001
- > Coagulase positive *Staphylococci*: method modified from AS 5013.12.1 2004
- > *Bacillus cereus*: method modified from AS 5013.2 2007
- > *Salmonella* species: method modified from AS 5013.10 2009
- > *L. monocytogenes*: method modified from AS 5013.24.1 2009

The sample preparation for *E. coli*, *B. cereus*, and coagulase positive *Staphylococci* consisted of:

- > 25g of sample being homogenised with 225mL of 0.1% peptone saline diluent
- > subsequent serial dilutions were prepared for use in enumeration.

***E. coli* enumeration:** Pour plates of tryptone bile x-glucuronide medium (TBX) agar using 1ml of 10^{-1} dilution were prepared in triplicate and incubated at 37°C for 4h followed by 44°C for 20h. *E. coli* colonies appear blue/green after incubation.

Coagulase positive *Staphylococci* enumeration: Pour plates of Baird Parker medium with Rabbit Plasma Fibrinogen using 1ml of 10^{-2} dilution (in duplicate) and a single 10^{-4} dilution were prepared and incubated at 37°C for 48h. Typical black colonies, with a halo of precipitation surrounding the colony were indicative of coagulase activity found in coagulase positive *Staphylococci*.

***B. cereus*:** Spread plates (using 100µl of 10^{-1} (in duplicate) and a 10^{-3} dilution,) on a solid selective medium containing egg yolk and mannitol (MYP) were incubated at 30°C for 24-48h. Typical large, pink colonies, with or without lecithinase action were counted and a proportion of the colonies confirmed by a haemolysis test on Sheep Blood Agar. Any resamples that were taken as statutory samples underwent confirmation via spore staining.

***Salmonella* detection:** 25g of sample was weighed out aseptically and homogenised with 225mL buffered peptone water (non-selective enrichment) and incubated at 37°C for 24h. Aliquots were then transferred into Brain Heart Infusion broth (BHI) and incubated for 3h at 37°C. DNA was extracted from enriched BHI.

This was screened for the presence of *Salmonella* using a DuPont BAX cyber green Polymerase Chain Reaction (PCR). Confirmation tests were not performed as all the samples screened negative.

***L. monocytogenes* detection:** 25g of sample was weighed out aseptically and homogenised with 225mL Half Fraser broth (selective enrichment) and incubated at 30°C for 24h. Aliquots were then transferred into tubes of both Fraser broth and MOPS BLEB broth which were incubated at 37°C for 48h and 37°C for 24h respectively. DNA was extracted from enriched MOPS BLEB broth. This was screened for the presence of *L. monocytogenes* using a BAX cyber green PCR. Confirmation tests were not performed as all the samples screened negative.

RESULTS/DISCUSSION

E. coli

All 112 survey samples were tested for *E. coli*. Ninety-six (85.7%) samples were satisfactory. Fifteen samples (13.4%) were marginal and one sample (0.9%) was unsatisfactory.

The presence of *E. coli* in RTE foods is undesirable. Its presence in pre-prepared salads indicates that poor sanitation and hygienic conditions has led to the contamination of the salad or raw ingredients have been contaminated during primary production.

26 resamples were tested for *E. coli*. No *E. coli* was detected in 23 samples. Two samples, both of kaleslaw, had unsatisfactory levels of *E. coli* (260 CFU/g and 240CFU/g). The PHO responsible for the inspections and gathering of samples determined that the most likely source of contamination was a manufacturer or supplier in Sydney. The outlet in the ACT ceased using the product and reported the incident to the Head Office of the chain. The HPS PHO reported the results, batch details and supplier details to the NSW Food Authority. The final resample, tabbouleh, also had unsatisfactory levels of *E. coli* (420 CFU/g). The premises, part of a national chain, did an internal investigation and shared the results with the PHO. Results were deemed acceptable by the Environmental Health Unit. An Improvement Notice was issued and education regarding hand washing and appropriate food storage was also given to the premises.

Bacillus cereus

B. cereus was tested for in 112 samples. One hundred and two (91.1%) samples were satisfactory; eight (7.1%) were marginal. One sample (0.9%) was unsatisfactory and another (0.9%) was potentially hazardous. A total of twenty resamples were tested for *B. cereus*. The premises corresponding to the unsatisfactory and potentially hazardous results were re-sampled and two of the resamples were found to be satisfactory with another two found to be in the marginal range. The business in consultation with the PHO has since sourced another supplier for these ingredients.

B. cereus can cause foodborne illness through either ingesting large numbers of bacterial cells and/or spores in the contaminated food (diarrhoeal type) or by ingesting food contaminated with pre-formed toxin (emetic type) (FSANZ, 2014). *Bacillus cereus* naturally occur in soils and their spores can survive for long periods of time. Raw foods of plant origin are the major source in foods. Since *B. cereus* is a spore former and ubiquitous in the environment, a low level of contamination of foods can be expected. Generally low levels of *B. cereus* will not cause illness unless its growth is permitted to occur. The presence of *B. cereus* in higher numbers in salads suggests raw ingredients may not have been washed and salads may have been left outside of temperature control allowing proliferation.

Coagulase positive *Staphylococci*

All 112 survey samples were tested for coagulase positive *Staphylococci*. 111 samples (99.1%) were satisfactory. One sample, beetroot salad, returned a marginal count of 100 CFU/g. A resample was collected and no coagulase positive *Staphylococci* were detected.

Staphylococcus aureus is a bacterium that causes staphylococcal food poisoning, a form of gastroenteritis with rapid onset of symptoms usually within three hours of ingestion (FSANZ, 2013) (AIFS, 2003). *S. aureus* is commonly found in the environment (soil, water and air) and is also found in the nose and on the skin of humans (FSANZ, 2013). Food handlers carrying enterotoxin-producing *S. aureus* in their noses or on their hands are regarded as the main source of food contamination via direct contact or through respiratory secretions (FSANZ, 2013). The presence of coagulase positive *Staphylococcus* in salads suggests improper food handling of salads due to poor hygiene of food handlers.

Salmonella spp

Salmonella spp was not detected in any of the 112 samples tested.

L. monocytogenes

Total of 112 survey samples were analysed for *L. monocytogenes*. All 112 samples (100%) were reported as satisfactory.

CONCLUSION

This snap-shot of 22 different retailers suggests that the microbiological quality of pre-prepared salads in the ACT was found to be generally good. No *Salmonella* spp and *L. monocytogenes* were detected in any survey samples. *E. coli* was found in 16 samples, Coagulase positive *Staphylococci* was found in marginal levels in only 1 sample and *Bacillus cereus* in ten. The majority of follow ups resulted in either inspection and education or change in suppliers for the premises affected.

Raw results of the analysis are attached at Appendix A. Resample results are attached in Appendix B.

BIBLIOGRAPHY

1. Guidelines for the microbiological examination of ready-to-eat foods FSANZ Dec 2001
2. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 January to 31 March 2010
3. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 April to 30 June 2010
4. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 July to 30 September 2010
5. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 October to 31 December
6. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 January to 31 March 2011
7. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 April to 30 June 2011.
8. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 July to 30 September 2011.
9. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 October to 31 December 2011.
10. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 January to 31 March 2012.
11. The OzFoodNet
12. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 April to 30 June 2012
13. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 July to 30 September 2012
14. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 October to 31 December 2012
15. Working Group, OzFoodNet Quarterly Report, 1 January to 31 March 2013.
16. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 April to 30 June 2013.
17. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 July to 30 September 2013
18. The OzFoodNet Working Group, OzFoodNet Quarterly Report, 1 October to 31 December 2013.
19. The OzFoodNet Working Group, Monitoring the Incidence and Causes of Diseases Potentially Transmitted by Food in Australia: Annual Report of the OzFoodNet Network, 2006.
20. The OzFoodNet Working Group, Monitoring the Incidence and Causes of Diseases Potentially Transmitted by Food in Australia: Annual Report of the OzFoodNet Network, 2010.
21. Foodborne Microorganisms of Public Health Significance, AISFT Inc (NSW Branch) Food Microbiology Group, sixth Edition, 2003
22. Bacillus cereus, FSANZ
<https://www.foodstandards.gov.au/publications/Documents/Bacillus%20cereus.pdf> , Last updated May 2013
23. Staphylococcus aureus Last updated May 2013
<https://www.foodstandards.gov.au/publications/Documents/Staphylococcus%20aureus.pdf>
24. Listeria monocytogenes
<https://www.foodstandards.gov.au/publications/Documents/Listeria%20monocytogenes.pdf> Last updated May 2013

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APPENDIX A – RAW RESULTS OF ANALYSIS

Assessment: S = satisfactory, M = marginal, U = unsatisfactory, PH= potentially hazardous

Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos <i>Staph</i> cfu/g	Assessment
Pasta salad	Absent	10	<50	Absent	<50	M
Apple and walnut salad	Absent	<3	<50	Absent	<50	S
Caesar salad	Absent	<3	<50	Absent	<50	S
Potato salad	Absent	<3	<50	Absent	<50	S
Pumpkin and feta salad	Absent	<3	<50	Absent	<50	S
Pumpkin, pine nut and tortellini salad	Absent	<3	<50	Absent	<50	S
Seasonal greens	Absent	<3	200	Absent	<50	M
Pumpkin, beetroot and fetta salad	Absent	<3	<50	Absent	<50	S
Lentil and tabouleh salad	Absent	<3	<50	Absent	<50	S
Basil pesto penne salad	Absent	<3	<50	Absent	<50	S
Sweet pumpkin and beetroot salad	Absent	<3	<50	Absent	<50	S
Teriyaki marinated chicken salad	Absent	<3	<50	Absent	<50	S

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos Staph cfu/g	Assessment
Chicken Caesar salad	Absent	<3	<50	Absent	<50	S
Lentil and tabouleh salad	Absent	3	<50	Absent	<50	M
Kale & quinoa salad	Absent	3	<50	Absent	<50	M
Chicken & sweet potato salad	Absent	<3	<50	Absent	<50	S
Caesar salad	Absent	7	50	Absent	<50	M
Caesar salad	Absent	47	<50	Absent	<50	M
Sweet potato & carrot salad	Absent	7	<50	Absent	<50	M
Quinoa and tabbouleh salad	Absent	<3	<50	Absent	<50	S
Cous-cous salad	Absent	<3	<50	Absent	<50	S
Coleslaw	Absent	<3	<50	Absent	<50	S
Garden salad	Absent	<3	<50	Absent	<50	S
Garden salad with chicken	Absent	<3	<50	Absent	<50	S
Mediterranean salad	Absent	<3	<50	Absent	<50	S
Tabbouleh	Absent	10	<50	Absent	<50	M
Caesar salad	Absent	<3	<50	Absent	<50	S
Greek salad	Absent	<3	<50	Absent	<50	S

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos Staph cfu/g	Assessment
Chicken fettuccini salad	Absent	<3	<50	Absent	<50	S
Chicken pasta salad	Absent	<3	<50	Absent	<50	S
Quinoa salad	Absent	<3	730000	Absent	<50	PH
Potato & egg salad	Absent	3	<50	Absent	<50	M
Sweet roasted pumpkin pine nut tortellini salad	Absent	<3	<50	Absent	<50	S
Chicken penne salad	Absent	3	<50	Absent	<50	M
Free range chicken, lentils & kale salad	Absent	<3	<50	Absent	<50	S
Mediterranean lentil tabbouleh	Absent	<3	<50	Absent	<50	S
Garden salad	Absent	<3	<50	Absent	<50	S
Garden salad	Absent	<3	<50	Absent	<50	S
Garden salad	Absent	<3	<50	Absent	<50	S
Crispy chicken salad	Absent	<3	<50	Absent	<50	S
Grilled chicken salad	Absent	<3	<50	Absent	<50	S
Chicken, capsicum, spinach and mashed vegetables salad	Absent	<3	<50	Absent	<50	S

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos <i>Staph</i> cfu/g	Assessment
Chicken, zucchini and capsicum salad	Absent	67	<50	Absent	<50	M
Egg, avocado and cabbage salad	Absent	47	<50	Absent	<50	M
Salmon, broccoli, capsicum and zucchini salad	Absent	80	<50	Absent	<50	M
Pulled pork, avocado, cabbage and onion salad	Absent	160	<50	Absent	<50	U
Pita Salad	Absent	<3	<50	Absent	<50	S
Tabbouleh salad	Absent	<3	<50	Absent	<50	S
Paella mix salad	Absent	<3	<50	Absent	<50	S
Mixed leaves salad	Absent	<3	<50	Absent	<50	S
Coleslaw	Absent	<3	<50	Absent	<50	S
Mushroom, lettuce, beetroot, carrot and tomato salad	Absent	<3	50	Absent	<50	S
Chicken Caesar salad	Absent	<3	<50	Absent	<50	S
Pomegranate, poppy seeds and quinoa salad	Absent	<3	<50	Absent	<50	S
Mixed leaves salad	Absent	<3	<50	Absent	<50	S

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos Staph cfu/g	Assessment
Coleslaw with tzatziki and hommus	Absent	<3	<50	Absent	<50	S
Red onion salsa	Absent	<3	50	Absent	<50	S
Salsa salad	Absent	<3	<50	Absent	<50	S
Corn salsa	Absent	<3	<50	Absent	<50	S
Tomato salsa	Absent	<3	<50	Absent	<50	S
Caesar salad	Absent	10	<50	Absent	<50	M
Mixed leaves	Absent	<3	<50	Absent	<50	S
Beetroot, carrot, quinoa, tomato and leaves salad	Absent	<3	<50	Absent	<50	S
Pomegranate and goat's cheese salad	Absent	<3	<50	Absent	<50	S
Beetroot, carrot, tomato and leaves salad	Absent	<3	<50	Absent	<50	S
Guacamole	Absent	3	<50	Absent	<50	M
Onion and coriander salsa	Absent	<3	250	Absent	<50	M
Tomato salsa	Absent	<3	<50	Absent	<50	S
Pumpkin seeds, tomato, onion, corn and black beans salad	Absent	<3	<50	Absent	<50	S

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos Staph cfu/g	Assessment
Corn salsa	Absent	<3	<50	Absent	<50	S
Pumpkin seeds, tomato, onion, corn and black beans salad	Absent	<3	<50	Absent	<50	S
Guacamole	Absent	<3	<50	Absent	<50	S
Corn salsa	Absent	<3	<50	Absent	<50	S
Tomato salsa	Absent	<3	<50	Absent	<50	S
Onion salsa	Absent	<3	<50	Absent	<50	S
Chicken avocado salad	Absent	<3	<50	Absent	<50	S
Southwest chicken salad	Absent	<3	<50	Absent	<50	S
Pesto barley salad	Absent	<3	<50	Absent	<50	S
Brown rice salad	Absent	<3	<50	Absent	<50	S
Beef salad	Absent	<3	<50	Absent	<50	S
Beetroot and feta salad	Absent	<3	<50	Absent	<50	S
Vegetable pasta salad	Absent	<3	<50	Absent	<50	S
Greek salad	Absent	<3	50	Absent	<50	S
Beetroot salad	Absent	<3	<50	Absent	100	M
Coleslaw	Absent	<3	1200	Absent	<50	U

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos <i>Staph</i> cfu/g	Assessment
Bean salad	Absent	<3	450	Absent	<50	M
Tabbouleh	Absent	<3	200	Absent	<50	M
Chicken chorizo salad	Absent	<3	<50	Absent	<50	S
Tuna pasta salad	Absent	<3	<50	Absent	50	S
Marinated beef salad	Absent	<3	<50	Absent	<50	S
Brown rice, cucumber, red capsicum, carrots, raisins, corn, and celery salad	Absent	<3	<50	Absent	<50	S
Pumpkin and couscous salad	Absent	<3	<50	Absent	<50	S
Tuna salad	Absent	<3	150	Absent	<50	M
Garden salad	Absent	<3	<50	Absent	<50	S
Pasta salad	Absent	<3	100	Absent	<50	M
Sprout salad	Absent	10	<50	Absent	<50	M
Cabbage salad	Absent	<3	<50	Absent	<50	S
Chicken garden salad (packaged)	Absent	<3	100	Absent	<50	
Chicken sweet potato salad (packaged)	Absent	<3	50	Absent	<50	

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Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos Staph cfu/g	Assessment
Fruit Salad	Absent	<3	<50	Absent	<50	S
Chicken garden salad (plate)	Absent	<3	50	Absent	<50	S
Chicken sweet potato salad	Absent	<3	<50	Absent	<50	S
Chicken Caesar salad	Absent	<3	<50	Absent	<50	S
Greek salad	Absent	<3	<50	Absent	<50	S
Garden salad	Absent	<3	<50	Absent	<50	S
Coleslaw	Absent	<3	<50	Absent	<50	S
Rocket and beetroot salad	Absent	<3	<50	Absent	<50	S
Corn salad	Absent	<3	50	Absent	<50	S
Chickpea salad	Absent	<3	50	Absent	<50	S
Tofu, carrot, beetroot leaves, brown lentils salad	Absent	<3	<50	Absent	<50	S
Lettuce, carrot, beetroot and capsicum salad	Absent	<3	<50	Absent	<50	S
Tandoori chicken salad	Absent	<3	<50	Absent	<50	S
Greek salad	Absent	<3	<50	Absent	<50	S
Caesar salad	Absent	<3	<50	Absent	<50	S

**MICROBIOLOGICAL QUALITY OF PRE-PREPARED SALADS
JANUARY-JUNE 2016**

Sample description	<i>Salmonella</i> in food P/A in 25g	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	<i>L. monocytogenes</i> in food P/A in 25g	Coag Pos Staph cfu/g	Assessment
Avocado salad	Absent	<3	<50	Absent	<50	S
Seafood salad	Absent	<3	<50	Absent	<50	S
Greek salad	Absent	<3	<50	Absent	<50	S
Caesar salad	Absent	<3	<50	Absent	<50	S
Garden salad	Absent	<3	250	Absent	<50	M
Pumpkin salad	Absent	<3	<50	Absent	<50	S

**MICROBIOLOGICAL QUALITY OF PRE-PREPARED SALADS
JANUARY-JUNE 2016**

APPENDIX B – RESAMPLE RESULTS

Assessment: S = satisfactory, M = marginal, U = unsatisfactory, PH= potentially hazardous

Sample description	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	Coag Pos Staph cfu/g	Assessment
Zucchini noodles	<3	-	-	S
Avocado	<3	-	-	S
Kale salad	260	-	-	U
Salsa	<3	-	-	S
Pasta salad	<3	<50	-	S
Cos lettuce unwashed	<3	<50	-	S
Mesculin lettuce mix unwashed	<3	<50	-	S
Quinoa salad with mesculin	<3	<50	-	S
Guacamole	<3	<50	-	S
Onion and coriander salsa	<3	<50	-	S
Garden salad	-	<50	-	S
Salad mix	-	<50	-	S
Dijon mustard sauce	-	<50	-	S
Baby spinach	-	200	-	M
Capsicum	-	<50	-	S

**MICROBIOLOGICAL QUALITY OF PRE-PREPARED SALADS
JANUARY-JUNE 2016**

Sample description	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	Coag Pos Staph cfu/g	Assessment
Caesar salad	<3	-	-	S
Caesar salad	<3	-	-	S
Caesar salad	<3	-	-	S
Dutch cream potato & egg	<3	-	-	S
Creamy basil pesto and chicken penne salad	<3	-	-	S
Basil penne salad	<3	-	-	S
Tabbouleh	420	-	-	U
Quinoa salad	-	<50	-	S
Raw/unmixed quinoa	-	<50	-	S
Unwashed lettuce	<3	50	-	S
Washed lettuce	<3	50	-	S
Sweet potato salad	<3	-	-	S
Caesar salad	<3	100	-	M
Pasta salad	<3	-	-	S
Kale salad	240	-	-	U
Tabbouleh	<3	-	-	S

**MICROBIOLOGICAL QUALITY OF PRE-PREPARED SALADS
JANUARY-JUNE 2016**

Sample description	<i>E.coli</i> count in food cfu/g	<i>B.cereus</i> result cfu/g	Coag Pos Staph cfu/g	Assessment
Cooked rice	<3	-	-	S
Cut tomato	<3	-	-	S
Coleslaw	-	<50	<50	S
Beetroot salad	-	50	<50	S
Tabbouleh	-	<50	<50	S
Bean salad	-	<50	<50	S

MICROBIOLOGICAL QUALITY OF PRE-PREPARED SALADS JANUARY-JUNE 2016

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